UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Northwest Region
7600 Sand Point Way N.E., Bldg. 1
Seattle, WA 98115

Refer to:
2001/01028

February 6, 2004

Mr. Fred Patron
U.S. Department of Transportation
Federal Highway Administration
The Equitable Center, Suite 100
530 Center Street NE
Salem, OR 97301

Re: Endangered Species Act Section 7 Formal Consultation and Magnuson-Stevens Fishery Conservation and Management Act Essential Fish Habitat Consultation on the Pacific Way to Dooley Bridge Project, Necanicum River Basin, Clatsop County, Oregon

Dear Mr. Patron:

Enclosed is a biological opinion (Opinion) prepared by NOAA's National Marine Fisheries Service (NOAA Fisheries) pursuant to section 7 of the Endangered Species Act (ESA) on the Pacific Way to Dooley Bridge Project, Necanicum River Basin, Clatsop County, Oregon. NOAA Fisheries concludes in this Opinion that the proposed action is not likely to jeopardize Oregon Coast coho salmon (*Oncorhynchus kisutch*). As required by section 7 of the ESA, NOAA Fisheries included reasonable and prudent measures with non-discretionary terms and conditions that NOAA Fisheries believes are necessary to avoid or minimize the effects of incidental take associated with this action.

This document also serves as consultation on essential fish habitat pursuant to section 305(b) of the Magnuson-Stevens Fishery Conservation and Management Act and its implementing regulations (50 CFR 600).

Please direct any questions regarding this letter to Tom Loynes of my staff in the Oregon State Habitat Office at 503.231.6892.

Sincerely,

For Michael R Crouse

D. Robert Lohn
Regional Administrator

Endangered Species Act - Section 7 Consultation
Biological Opinion

&

Magnuson-Stevens Fishery Conservation and Management Act
Essential Fish Habitat Consultation

Pacific Way to Dooley Bridge Project
Necanicum River Basin, Clatsop County, Oregon

Agency: Federal Highway Administration

Consultation Conducted By: NOAA's National Marine Fisheries Service, Northwest Region

Date Issued: February 6, 2004

For Michael R Crouse

Issued by: ________________
D. Robert Lohn
Regional Administrator

Refer to: **2001/01028**

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1. INTRODUCTION

The Endangered Species Act (ESA) of 1973 (16 USC 1531-1544), as amended, establishes a national program for conserving threatened and endangered species of fish, wildlife, plants, and the habitat on which they depend. Section 7(a)(2) of the ESA requires Federal agencies to consult with U.S. Fish and Wildlife Service and NOAA's National Marine Fisheries Service (NOAA Fisheries), as appropriate, to ensure that their actions are not likely to jeopardize the continued existence of endangered or threatened species or adversely modify or destroy their designated critical habitats. This biological opinion (Opinion) is the product of an interagency consultation pursuant to section 7(a)(2) of the ESA and implementing regulations found at 50 CFR 402.

The analysis also fulfills the essential fish habitat (EFH) requirements under the Magnuson-Stevens Fishery Conservation and Management Act (MSA). The MSA, as amended by the Sustainable Fisheries Act of 1996 (Public Law 104-267), established procedures designed to identify, conserve, and enhance EFH for those species regulated under a Federal fisheries management plan. Federal agencies must consult with NOAA Fisheries on all actions, or proposed actions, authorized, funded, or undertaken by the agency, that may adversely affect EFH (§305(b)(2)).

1.1 Background and Consultation History

On July 26, 2001, NOAA Fisheries received a letter from the FHWA requesting consultation pursuant to section 7(a)(2) of the ESA and EFH consultation pursuant to section 305(b)(2) of the MSA on the Pacific Way to Dooley Bridge Project in Clatsop County. Submitted with the letter was a biological assessment (BA) describing the proposed action and potential effects that may result from project implementation. In the draft BA, the FHWA determined that the proposed action is likely to adversely affect OC coho salmon, an ESA-listed species, and requested formal consultation. NOAA Fisheries responded with a letter of nonconcurrence to the FHWA on November 1, 2001, indicating that the consultation could not be completed until additional information was provided. On August 13, 2003, NOAA Fisheries received the requested information via e-mail as an amendment to the BA, and consultation was initiated at that time.

This Opinion considers the potential effects of the proposed action on OC coho salmon, which occur in the proposed action area. OC coho salmon were listed as threatened under the ESA on August 10, 1998 (63 FR 42587) and protective regulations were issued on July 10, 2000 (65 FR 42422). The objective of this Opinion is to determine whether the proposed action is likely to jeopardize the continued existence of OC coho salmon. This consultation is conducted pursuant to section 7(a)(2) of the ESA and its implementing regulations, 50 CFR 402.

1.2 Proposed Action

The proposed action is the funding to the Oregon Department of Transportation (ODOT) by the FHWA for the construction of two bridges and a highway re-design and construction. The BA for this project describes a set of “conservation measures” designed to minimize take of listed species related to in-water and bank work, clearing and grubbing, bridge removal, erosion control, hazardous materials, and site-specific conservation and habitat remediation measures. NOAA Fisheries regards these conservation measures as integral components of the proposed action. Specific elements of the proposed project are described below.

1.2.1 Section 1

Section 1 would follow the existing alignment of US 101 from Pacific Way in Gearhart to 24th Avenue in Seaside. The existing highway has a 4.2-meter (m) continuous turning median, two 3.6-m travel lanes, and 2.4-m shoulders on each side. The total width of the paved portion of the existing highway is 16.5 m with no sidewalks or gutters.

This section will have a parkway design which includes two 3.6-m travel lanes in each direction, a 3.6-m landscaped median, a 1.8-m shoulder/bike lane in each direction, sidewalks, storm sewer, curbs and gutters. The width of the highway would be increased by 2.9 m on each side, creating a total paved surface width of 22.2 m (excluding landscaping strips, sidewalks, and easements).

The existing Lewis and Clark Road/US 101 intersection would be moved north approximately 120 m away from the Neawanna Creek Bridge creating an "S" curve in Lewis Clark Road, which would connect to US 101 with a T-shaped intersection.

Neawanna Creek Bridge

The existing Neawanna Creek Bridge is a 4-span, 63.4-m long reinforced concrete structure with two 1.5-m sidewalks, two 3.6-m travel lanes, and 600-millimeter (mm) shoulders. Untreated runoff from this bridge drains directly to Neawanna Creek.

This project will involve removal and replacement of the existing bridge over Neawanna Creek. The bridge concept presented in the July 2001 BA is no longer valid and has been amended to reflect changes and details of design. Concept plans for two alternative designs were completed by ODOT in response to the request for additional information from NOAA Fisheries. Given that the final bridge design has not been selected, the design described in this section assumes cumulative elements (*i.e.*, a combined footprint of both designs).

Two structures, a northbound (NB) and a southbound (SB) bridge, will replace the existing structure with the second structure facilitating the widened roadway. The new structures would either fully span the creek, or place a single bent within the wetted channel of Neawanna Creek. Two design options are under consideration for the bridge replacement: (1) An above-deck straight arch bridge with cable stays; or (2) a 2-span concrete girder bridge.

Arch Concept
Under the arch concept, two straight arch bridges with cable stays would be constructed. Each bridge would be 72 m long and approximately 18 m wide, with two travel lanes, sidewalks, and shoulders. These bridges would have relatively deep end walls at the abutments to protect against scour.

The abutments for both proposed bridges would require two fill areas of roughly equal dimension at the north end of the SB structure, and at the south end of the NB structure. The total fill areas would be approximately 260 m^2. With the exception of these fill areas, the arch bridges would fully span Neawanna Creek, and eliminate the existing in-water bents.

Two-Span Concept
With the 2-span concept, the existing Neawanna Bridge would be replaced with a conventional pre-stressed concrete girder bridge. This would require close girder spacing using approximately 30 girders total. The structure would be constructed in a twin configuration separated by the median. Both bridges would be approximately 65 m long and 13 m wide, each requiring three bents. Center bents for both NB and SB structures would be in the wetted channel of Neawanna Creek.

Three fill areas would be required for construction of the substructure of both north and south bridges. Two fill areas at the north end of each bridge totaling approximately 76 m^2 would be required, with the western area likely extending into the wetted channel of Neawanna Creek. Center bents for the bridges would require a combined 330 m^2 of fill. The majority of this fill would be in the wetted channel of Neawanna Creek. The total fill area for the 2-span concept would be approximately 410 m^2.

Construction Elements
Elements of the Neawanna Creek Bridge removal, including construction sequencing, pile driving, grading, and demolition, are discussed below.

Sequencing of construction activities associated with removal and construction of the Neawanna Bridge will be phased to accommodate traffic flow during construction. Temporary work bridges will be required to construct both bridges and to remove the existing bridge. Major phases of the project will include the following:

- Construction of the work bridge on west side of the existing bridge.
- Isolation of the work area if fill material or concrete is placed below ordinary high water (OHW).
- Construction of the NB structure while traffic flow remains on the existing structure.
- Route traffic onto NB structure and remove the work bridge.
- Relocate the work bridge on the west side of the existing bridge.
- Removal of the existing bridge and containment of demolition debris.
- Isolation of the work area if fill material or concrete is placed below OHW.
- Construction of the SB structure.
- Restore traffic flow and remove the work bridge.

Stormwater runoff from the bridge deck will be routed to a treatment facility before entering aquatic systems.

Fill material will be required along the banks of Neawanna Creek for both designs. The banks surrounding the existing bridge have been heavily damaged by road and commercial development, and provide minimal ecosystem structure and function. These areas include a roadfill above an intact estuarine wetland along the southeast bank.

A temporary work bridge will be constructed for each structure and demolition of the existing structure. The work bridges would be approximately 6 m wide to facilitate construction equipment. The work bridges would belong to the contractor, but ODOT will require that the bridges have a minimum 5-m span length, use no treated wood, and are completely removed after completion of bridge construction activity.

In-channel work will be required during the construction of the Neawanna Creek Bridge and the removal of the existing bridge. The work area below the OHW will be isolated and dewatered, with fish removed from the work area. Isolation would begin with the installation of a coffer dam to isolate the work area. Once the coffer dam is in place, fish will be salvaged using ODFW- and NOAA Fisheries-approved methods for fish salvage operations. Following removal of fish from the work area, water will be pumped out of the isolated area and treated before release.

End abutments and instream bents (for the 2-span bridge) will require numerous steel piles driven into the channel substrate. Work area isolation will be required for this activity, and will be conducted in cooperation with ODFW.

The end abutments and instream bents will most likely be pile supported, with pile caps poured on driven pile. However, spread footings poured on the steel piles may be used. Containment measures will be installed to prevent concrete or construction materials from entering Neawanna Creek. Minor grading will be required along both banks, and additional riprap will be required in the scour critical zone along the streambank directly under the bridge.

Pile driving will be restricted to the ODFW-defined estuarine in-water work period for Neawanna Creek (November 1 to February 15) (ODFW 2000). Construction will likely extend over three to four seasons. An anticipated construction schedule during each summer in-water work window is presented below:

Year 1

- Install the first work bridge.
- Construct the substructure of the new structure.
- Complete the new structure outside of in-water work window, with the temporary work bridge maintained over winter.

Year 2

- Remove the first work bridge.
- Install the second work bridge.
- Construct containment around the existing structure.
- Demolish the existing structure.
- Demolition may continue outside of in-water work window and the temporary work bridge will be maintained over winter.

Year 3

- Construction of the new structure.
- Removal of the second work bridge.

Mill Creek Culvert

The existing Mill Creek crossing consists of three 180-centimeter (cm) diameter, 26.2-m long corrugated metal pipes with tidegates, concrete headwalls and wingwalls. The tidegates were replaced with plywood sheets and stationed in the upright position. These emergency gates are out of the area of tidal influence except in extreme cases of flooding. The proposed crossing will provide a 30.5-m roadway by extending the existing pipes approximately 18.3 m up Mill Creek, avoiding any impact to Neawanna Creek to the west, and extending the toe of the fill slope about 16.8 m from the existing toe.

Water will be diverted from the work area during culvert installation. A water diversion dam will be installed upstream of the project area and a temporary diversion pipe will be placed in one of the three pipes to maintain downstream discharge. The temporary diversion will be moved to a different pipe as each pipe is successively extended.

With the flow diverted and fish removed, the exposed substrate will be excavated, graded, and compacted to form a foundation for the extended pipe. The streambanks beside the outermost culverts may require grading as well. The prepared area, including the disturbed banks, will be filled with compacted material after the three pipes have been extended.

1.2.2 Section 2

This section of the project will also follow the existing US 101 route and is between 24th Avenue and Avenue M in Seaside. The existing roadway consists of two 3.6-m travel lanes and 2.4-m wide paved and unpaved shoulders for a total highway width of 12.2 m.
A parkway design will also be used for this section. The highway in section 2 would be widened toward the east to take advantage of the vacated railroad right-of-way, thus minimizing impacts to the community and the environment. This change would increase the width of the existing highway by 10 m and bring the total width of the highway to 22.2 m, excluding the landscaping strips, sidewalks, and easements.

1.2.3 Section 3

This section will be between Avenue M and Dooley Bridge and encompass the most commercially developed of the three sections. The existing highway in this section is 12.2 m wide and consists of two 3.6-m travel lanes, 2.4-m wide paved and unpaved shoulders, and a continuous left-turn lane between Avenue P and Avenue R. The NB route of the couplet would require minor filling of the western millpond to accommodate the roadway prism.

Couplet Design

A couplet design will provide two one-way streets of two lanes each. The couplet will begin at approximately the South Holladay Drive/US 101 intersection and will end north of Dooley Bridge, where the NB and SB lanes will merge. The SB lanes of the couplet will be routed over the existing highway. The NB lanes will be routed over a newly constructed roadway on the abandoned railroad right-of-way. Each one-way section will involve two 3.6-m travel lanes, 1.8-m shoulder/bike lanes, and 1.8-m sidewalks. Storm drains, curbs, and gutters will be installed. Two bridges will be built across an unnamed tributary of the Necanicum River; with one replacing an existing structure.

Bridge over Unnamed Tributary of the Necanicum River

The existing multi-span bridge that crosses the unnamed tributary of the Necanicum River will be replaced with two single-span bridges near the terminus of the couplet. Traffic will be routed over the existing structure while one of the new bridges is constructed. Traffic will then be routed over the new structure while the existing structure is replaced. Runoff from the existing structure is diverted directly into the tributary. ODOT's intent is to reduce the existing influence of the structure on the hydrology and water quality of the aquatic environment.

This area of the project is a relatively intact, willow-alder wetland bordered by reed canarygrass and wet pasture. The area beneath the bridge generally lacks flowing water, and thus it is unlikely that work area isolation or fish salvage will be needed. However, bridge removal, including removal of treated timber piles, will occur during the freshwater in-water work window of July 1 to September 15. Erosion and sediment control measures will be implemented to contain any sediment-laden water within the project area.

Two fill areas will be required to construct the approaches for the new bridges, and to support the bridge itself. Approximately 2,300 m^3 of fill over an area of approximately 0.16 hectares (ha) is needed to support the couplet roadway. Of this fill, an estimated 1,760 m^3 over an area of approximately 0.12 ha is within the delineated wetland. The fill for the bridge is estimated to be approximately 31 m^3 over an area of about 46 m^2. ODOT has requested an exception to Goal 17 from the City of Seaside authorizing the use of fill material within this area.

Construction and staging of the new bridges will generally occur in the manner described above for Neawanna Bridge. Traffic would be routed over the existing structure while one of the new bridges is constructed, and then be routed over the new structure while the existing structure is replaced.

Earthwork

About 57,000 to 68,000 m^3 of excavation would be required for the project. Most of this will be used for fill material. Only a minor amount of additional fill material will be necessary along the project.

1.2.4 Stormwater Treatment

ODOT's intent is to treat at least 140% of the stormwater runoff associated the new and newly-curbed impervious surfaces associated with the project. The project area landscape provides a difficult setting in which to treat runoff due to the extremely flat grade and proximity to riparian, estuarine, and wetland areas. The following water quality treatment locations and methods will be used.

Location 1 – Ball Field

The contributing area to this facility includes pavement surfaces from the beginning of the project Station 14+460 to Station 15+700 and is approximately 3.3 ha in size. The facility will be west of Pacific Highway on a strip of land behind the baseball field. This land is covered with thick, mowed grass and the facility will have a grassed swale design due to the flat slopes and evidence of ease of vegetation growth. The outfall for the stormwater from this facility enters an unnamed tributary to Neawanna Creek and will require the construction of a new outfall, with an energy dissipater.

Location 2 – Lewis & Clark Road

The contributing area to this facility includes pavement surfaces from Station 15+700 to Station 16+000 and includes portion of Lewis & Clark Road and Wahanna Rd. The total contributing area is approximately 1.2 ha in size. The facility will be east of Pacific Highway and east of Wahanna Rd and will be south of, and parallel to Lewis & Clark Road. This land is covered with pavement and grass and will use a grassed swale design for this facility due to the geometry of the church frontage and the new Lewis & Clark Road alignment. The outfall for the stormwater from this facility will enter Neawanna Creek and will require the construction of a new outfall with an energy dissipater.

Location 3 – High School Road

The contributing area to this facility includes pavement surfaces from Station 16+000 to Station 16+725. The total contributing area for locations 3 and 4 combined is approximately 4.7 ha in size. How these areas are distributed between the two facilities will be determined during design. The High School Road facility will be west of Pacific Highway and north of Seaside High School in a long strip between Pacific Coast Highway and the new access road to Seaside High School. This land is covered with mowed grass and small shrubs and will use a grassed swale design for the facility to use the narrow strip of land between Pacific Highway and the High School access road that will be isolated by the roadway alignments. The outfall for the stormwater from this facility enters Neawana Creek and will require the construction of a new outfall and energy dissipater and will be shared by the Bus Barn Road facility.

Location 4 – Bus Barn Road
The contributing area to this facility includes pavement surfaces from Bus Barn road frontage roads on the east side of the highway from Station 16+200 to Station 16+450. The facility will be east of Bus Barn Road north of the Bus Barn. This land is covered with blackberries and scrub brush and will use a grassed swale design for this facility due to ease of maintenance and minimal standing water in this type of facility. The outfall for the stormwater from this facility enters Neawana Creek and will require the construction of a new outfall and energy dissipater and will be shared by the High School Road facility Location 3.

Location 5 – 14th Avenue
The contributing area to this facility includes pavement surfaces from Station 16+725 to Station 17+280 and is approximately 1.9 ha in size. The facility will be east of Pacific Highway north of 14th Ave. This land is covered with blackberries and trees and will use a grassed swale design for this facility. A swale uses less land area than a pond and can be placed beside 14th Avenue, minimizing the impact on the adjacent private property. The outfall for the stormwater from this facility enters Neawanna Creek and will require the construction of a new outfall. The outfall will be directed into an existing channel within the marsh and include an energy dissipater.

Location 6 – Section Line Avenue
The contributing area to this facility includes pavement surfaces from Station 17+280 to Station 18+080 and is approximately 2.6 ha. The facility will be east of Pacific Highway north of Section Line Avenue near to a sanitary sewer pump station. This land is covered with scrub grasses, blackberries and trees and will use a grassed swale design for this facility due to ease of maintenance. The outfall for the stormwater from this facility enters Neawanna Creek and will use an existing outfall location.

Location 7 – Holladay Drive
The contributing area to this facility includes pavement surfaces from Station 18+080 to Station 19+050 and is approximately 3.3 ha in size. The facility will be between the NB and SB Couplet sections of Pacific Highway immediately south of Holladay Drive. This land is covered with compacted gravel and will use an extended dry pond design for this facility due to the circular shape and lower elevation of the location. The outfall for the stormwater from this facility will include an energy dissipater and enters the Necanicum River.

Location 8 – Avenue 'U'
The contributing area to this facility includes pavement surfaces from both the NB and SB Couplet Sections from Station 19+050 to Station 19+700 and is approximately 2.3 ha in size. The facility will be between the NB and SB Couplet Sections of Pacific Highway immediately south of Avenue 'U'. This land is covered with blackberries and will use an extended dry pond design for this facility or a grassed swale design. The final facility type decision will be based on minimizing the required footprint and aesthetics. The outfall for the stormwater from this facility enters Mill Pond and will require the construction of a new outfall with an energy dissipater.

Location 9 – North Dooley Bridge
The contributing area to this facility includes pavement surfaces from both the NB and SB Couplet Sections from Station 19+700 to Station 20+160 and is approximately 1.8 ha in size. The facility will be between the NB and SB Couplet Sections of Pacific Highway immediately North of Dooley Bridge. This land is covered with blackberries and trees, and will use an extended dry pond design for this facility due to space limitations between the NB and SB couplet. The outfall for the stormwater from this facility enters the Shangri-La Creek and will require the construction of a new outfall. This outfall may be sited within the footprint of new bridge abutments.

Location 10 – South Dooley Bridge
The contributing area to this facility includes pavement surfaces from Station 20+160 to Station 20+654 and is approximately 1.2 ha. The facility will be west of Pacific Highway along the west edge of pavement. This land is covered with thick grass and will use a BMP grassed swale design for this facility. The outfall for the stormwater from this facility enters an unnamed tributary to the Necanicum River and will require the construction of a new outfall including an energy dissipater.

This facility is a very long BMP type facility that would use basic design parameters necessary to maximize pollutant removal (1.2 m flat bottom, 3:1 side slopes, *etc.*), but would not be considered an “engineered” water quality facility. An alternative to this concept would be to provide an “engineered” grassed swale. This would minimize the footprint requirements, but would increase design, construction and maintenance efforts.

1.2.5 Mitigation

The proposed Pacific Way to Dooley Bridge project is expected to result in a variety of permanent and temporary adverse effects to coho salmon and their habitat. The project would impact fisheries habitat (including wetlands, riparian, and estuarine habitats) throughout the Lower Necanicum River Basin. Temporary adverse effects would be those associated with construction activities and generally include, but are not limited to turbidity, short-term sedimentation, vegetation removal, temporary access roads, and potential hazardous material spills. Permanent adverse effects would be those resulting from the construction of permanent structures and include hydrologic and water quality impacts associated with increased impervious surface areas, stream channel alterations associated with culverts and bridges, permanent vegetation loss, and filling of estuarine wetlands.

ODOT proposes to provide mitigation for permanent fisheries and wetland impacts associated with the proposed project. ODOT biologists determined that it would be desirable to combine mitigation efforts for fisheries, estuarine, and wetland impacts due to the close ecological relationship between each of these highly valued resources.

As stated earlier, unavoidable impacts to wetlands have been identified in connection with several facets of this project. Replacement of impacted estuarine and freshwater wetland functions and values will require the development of compensatory mitigation within the project corridor with functions/values similar to those resources that were impacted. A detailed compensatory mitigation plan will be completed once the project design has become fully developed and finalized. However, concept plans for wetland, estuarine, and freshwater impacts have already been developed and are summarized below.

Compensatory mitigation for estuarine impacts includes estuarine creation within an abandoned home site owned by the school district, beside the bus barn across from Seaside High School. This upland property is beside the Neawanna Creek portion of the Necanicum Estuary. Compensatory mitigation for freshwater wetland impacts will involve creation of fringe wetlands on the northern edge of the western-most millpond. The City of Seaside owns the land north of the western millpond and will work with ODOT to develop a suitable plan to meet the needs of the project.

The intent of the compensatory mitigation for the estuarine impacts is to create at least 0.15 ha of low/high salt marsh estuary with mud flats and a tidal inlet for fish habitat that will offset lost functions and values. Estuarine creation will include excavation of sufficient upland ground to establish a brackish, mixed semidiurnal tidal regime (two daily unequal high and low daily tidal sequences) similar to that occurring within Neawanna Creek. The created estuarine area will develop with vegetated flats similar to the marsh areas beside the mitigation site. As tidewater is introduced, native plant material and seeds will flush into the created estuary to start a natural succession process that would establish vegetation within this brackish setting.

Compensatory mitigation for freshwater wetland impacts will create a minimum of 1.1 ha of palustrine, forested and scrub-shrub wetland around the most western millpond to replace lost functions and values. The compensatory mitigation effort will include seeding and planting of native tree and shrub species to establish a forested, bottomland wetland setting. Native grasses will be established to provide necessary ground cover, while the trees will improve the native habitat of the site.

The created freshwater wetland will be contoured with a flat grade with 10:1 slopes to blend in the existing lake fringe topography. The created, forested wetlands will have approximate 3:1 side slopes to an elevation at the top edge of the mitigation site. The created wetlands will develop into a Palustrine, Forested/Scrub-Shrub continually-wetted system. Creation of the mitigation site will increase wetland functions such as groundwater recharge, sediment stabilization, sediment/toxicant removal, and nutrient removal/transformation with fishery/wildlife habitat values.

The compensatory mitigation plan will include an annual monitoring program by ODOT Environmental Services for five years to document the development of wetland conditions and success of performance standards. The monitoring plan will involve the establishment of sampling plots to track hydrologic development and plant survival, composition and density over time. Photographic monitoring will be conducted to provide a visual record of the mitigation effort. Established photograph points will document plant community type development and coverage. Annual reports detailing monitoring results will be submitted by December of each of the required five-year period. The monitoring report will identify any gains and deficiencies in the progress of the mitigation sites, and, if needed potential corrective actions.

1.3 Description of the Action Area

The action area is defined as all areas to be affected directly or indirectly by the Federal action and not merely the immediate area (project area) involved in the proposed action (50 CFR 402.02). For this consultation, the action area includes all marine and riverine habitats accessible to OC coho salmon in the Necanicum River and tributaries from the river mouth upstream to the extent of visible turbidity on incoming tides.

2. ENDANGERED SPECIES ACT

2.1 Biological Opinion

This Opinion considers the potential effects of the proposed action on OC coho salmon which occur in the action area.

2.1.1 Biological Information

Spawning, incubation, rearing, and migration occur throughout accessible reaches of the Necanicum River basin (Table 1).

Table 1. OC Coho Salmon Life History Timing in the Necanicum River Basin (Weitkamp 1995, Oregon Department of Fish and Wildlife, [ODFW] 2003). Light Shading Represents Low-Level Abundance, Dark Shading Represents Peak Abundance

	J	F	M	A	M	J	J	A	S	O	N	D
River Entry												
Spawning												
Incubation-Intragravel Development												
Juvenile Freshwater Rearing												
Juvenile Migration												
Juvenile Residence in Estuary												

Estimated escapement of coho salmon in coastal Oregon was about 1.4 million fish in the early 1900s, with harvest of nearly 400,000 fish (Weitkamp *et al.* 1995). Abundance of wild OC coho salmon declined during the period from about 1965 to 1975 (Nickelson *et al.* 1992).

Lichatowich (1989) concluded that production potential (based on stock recruit models) for OC coho salmon in coastal Oregon rivers was only about 800,000 fish, and associated this decline with a reduction in habitat capacity of nearly 50%. Wild spawner abundance in this evolutionarily significant unit (ESU) has ranged from 16, 510 adults in 1990 to 59,453 adults in 1996, to nearly 239,000 adult coho in 2002 (ODFW 2003).

Estimated spawning populations for naturally-produced coho salmon in the Necanicum River basin averaged 1,099 adults from 1990 through 2002 (Table 2).

Survey data collected by ODFW in the Necanicum River basin estimated densities of juvenile OC coho salmon ranging from 0.07 fish m^2 to 0.11 fish m^2 (ODFW 2000).

Table 2. Estimated Spawning Populations for Naturally-Produced Coho Salmon in the Necanicum River and Elk Creek Basins (Jacobs *et al.* 2001)

Year	**1990**	**1991**	**1992**	**1993**	**1994**	**1995**	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**	**2002**
	191	1135	185	941	408	211	768	253	946	728	474	5247	2799

2.1.2 Evaluating Proposed Actions

The standards for determining jeopardy are set forth in section 7(a)(2) of the ESA as defined by 50 CFR 402.02 (the consultation regulations). In conducting analyses of habitat-altering actions under section 7 of the ESA, NOAA Fisheries uses the following steps of the consultation regulations and when appropriate combines them with the Habitat Approach (NOAA Fisheries 1999): (1) Consider the biological requirements of the listed species; (2) evaluate the relevance of the environmental baseline in the action area to the species' current status; (3) determine the effects of the proposed or continuing action on the species; and (4) determine whether the species can be expected to survive with an adequate potential for recovery under the effects of the proposed or continuing action, the effects of the environmental baseline, and any cumulative effects, and considering measures for survival and recovery specific to other life stages. In completing this step of the analysis, NOAA Fisheries determines whether the action under consultation, together with cumulative effects when added to the environmental baseline, is likely to jeopardize the ESA-listed species. If so, NOAA Fisheries may identify reasonable and prudent alternatives for the action that avoid jeopardy, if any exist.

The fourth step above requires a two-part analysis. The first part focuses on the action area and defines the proposed action's effects in terms of the species' biological requirements in that area (*i.e.*, effects on essential habitat features). The second part focuses on the species itself. It describes the action's effects on individual fish, or populations, or both, and places these effects in the context of the evolutionarily significant unit (ESU) as a whole. Ultimately, the analysis seeks to answer the question of whether the proposed action is likely to jeopardize a listed species' continued existence.

2.1.3 Biological Requirements

The first step in the methods NOAA Fisheries uses for applying the ESA section 7(a)(2) to listed salmon is to define the species' biological requirements that are most relevant to each consultation. NOAA Fisheries also considers the current status of the listed species taking into account population size, trends, distribution and genetic diversity. To assess the status of the listed species, NOAA Fisheries starts with the determinations made in its decision to list the species for ESA protection and also considers new data available that is relevant to the determination.

The biological requirements are population characteristics necessary for OC coho salmon to survive and recover to naturally-reproducing population levels, at which time protection under the ESA would become unnecessary. Adequate population levels must safeguard the genetic diversity of the listed stock, enhance its capacity to adapt to various environmental conditions, and allow it to become self-sustaining in the natural environment.

For actions that affect freshwater habitat, NOAA Fisheries usually describes the habitat portion of a species' biological requirements in terms of a concept called properly functioning condition (PFC). PFC is defined as the sustained presence of natural, habitat-forming processes in a watershed that are necessary for the long-term survival of the species through the full range of environmental variation (NOAA Fisheries 1999). PFC, then, constitutes the habitat component of a species' biological requirements. OC coho salmon survival in the wild depends upon the proper functioning of ecosystem processes, including habitat formation and maintenance. Restoring functional habitats depends largely on allowing natural processes to increase their ecological function, while at the same time removing adverse effects of current practices. For this consultation, the biological requirements are improved habitat characteristics that would function to support successful adult migration and juvenile rearing, upstream and downstream migration, and smoltification.

Essential habitat features for juvenile rearing (growth and development) areas include adequate water quality, water quantity, water velocity, cover and shelter, dietary and spatial resources, riparian vegetation, and safe passage to upstream and downstream habitats. Essential habitat features for juvenile migration corridors include adequate water quality, water quantity, water velocity, cover and shelter, dietary resources, riparian vegetation and space. Essential habitat features for adult migration corridors include adequate water quality, water quantity, water velocity, cover and shelter, riparian vegetation and space.

2.1.4 Environmental Baseline

The environmental baseline is an analysis of the effects of past and ongoing human and natural factors leading to the current status of the species or its habitat and ecosystem within the action area. The action area is defined as all areas to be affected directly or indirectly by the Federal action and not merely the immediate area involved in the action (50 CFR 402.02). Direct effects occur at the project site and may extend upstream or downstream based on the potential for impairing fish passage, hydraulics, sediment and pollutant discharge, and the extent of riparian habitat modifications. Indirect affects may occur throughout the watershed where actions described in this Opinion lead to additional activities or affect ecological functions contributing to stream degradation. For this consultation, the action area includes the affected streambed, bankline, adjacent riparian zone, and aquatic areas on Neawanna Creek from the confluence with the Necanicum River upstream to the extent of visible turbidity on incoming tides.

The bulk of production for the OC coho salmon ESU is skewed to its southern portion where the coastal lake systems (*e.g.* Tenmile, Tahkenitch, Siltcoos Basins) and the Coos and Coquille Rivers are more productive. Necanicum River coho salmon populations have been characterized as depressed (*e.g.*, spawning habitat under-seeded, declining trends, or recent escapements below long-term average) and at moderate risk of extinction (Weitkamp *et al.* 1995). OC coho salmon are known to spawn in the Necanicum River and Neawanna Creek, and use the waterways for rearing.

<u>Neawanna Creek</u>

Neawanna Creek is a small coastal stream with headwaters in the local mountains southeast of the City of Seaside. The creek is approximately 5.4 miles long and drains the small watersheds immediately east of the city. Tributaries include Mill Creek, Thompson Creek, and Sunquist Creek. Flows are discharged into the Necanicum estuary approximately 0.5 mile from the Pacific Ocean.

In the subject reach, Neawanna Creek is tidal and slightly channelized with streambanks stabilized primarily by non-native vegetation. Rock riprap and timber bulkheads are found at the existing bridge abutments. Fill material has encroached upon the historic floodplain for the bridge approaches and to provide development along adjacent banks. The bridge may function as a control point at some flows and prevents natural channel migration. A small stand of conifers and hardwoods exist southeast of the eastern bridge approach. The western bank and northern portion of the eastern bank are sparsely vegetated. Halophytic sedge species grow on the banks near the tidal zone of the river. Non-native species dominate streambank vegetation.

Land use in the watershed includes urban and rural residential, commercial, pasture, RV camping, and logging. Lower reaches of the river are tidal and heavily urbanized. The upper watersheds have been logged. Neawanna Creek is not listed on the Oregon Department of Environmental Quality 303(d) list for water quality (ODEQ 2002).

<u>Necanicum River</u>

The Necanicum River is a small coastal river with a mainstem starting at the base of Humbug Mountain and traveling 21 miles to Seaside where it empties into the Pacific Ocean. Due to the geology of the basin and the shallow aquifer, the Necanicum River rises very quickly during storms, causing high velocity scouring.

The Necanicum River is highly channelized. Streambanks in the project area consist of approximately 6.6-foot tall terraces stabilized by vegetation and riprap. Limited riprap placement has occurred along the bridge footings with associated fill to minimize erosion potential at the end bents. At bank-full flow, this has resulted in a hardpoint constriction to flow. Immediately downstream of the bridge, the constriction causes erosional backwater eddies that have widened the streambed. On the southwest bank just upstream of the bridge, stormwater is delivered to the creek via a 12-inch concrete pipe. Halophytic sedge species grow on the banks near the tidal zone of the river. The rest of the banks are dominated by non-native species.

Land use in the watershed includes urban and rural residential, commercial, pasture, and logging. Lower reaches of the Necanicum River are tidal and heavily urbanized. The upper watershed has been logged and some large landslides have occurred in the basin. The Necanicum River is on the Oregon Department of Environmental Quality 303(d) list for water quality not meeting the bacteria criterion (ODEQ 2002).

2.1.5 Analysis of Effects

In the jeopardy analysis, NOAA Fisheries evaluates the effects of proposed actions on listed species and seeks to answer the question of whether the species can be expected to survive with an adequate potential for recovery if those actions go forward.

2.1.5.1 Effects of the Proposed Action

Work Areas/Isolation
Bridge bent construction and removal will likely require work area isolation from the flowing water. Fish removal activities would be in accordance with NOAA Fisheries fish handling guidelines (NOAA Fisheries 2000). Any listed fish removed from the isolated work areas would experience high stress with the possibility of up to a 5% delayed mortality rate depending on rescue method. Work area isolation can result in a loss of aquatic invertebrates due to dewatering areas within the wetted channel. In addition, sediment laden water created within isolated work areas could escape, resulting in impacts to the aquatic environment downstream of the project site.

Steel Pile Driving
The project will require the installation of steel pipe piles for support on the work bridges and the abutments for the new bridges. These piles will be steel and will be installed via a vibratory hammer or an impact hammer. It is anticipated that the majority of the piles will be hollow steel and installed with an impact hammer.

Biological effects to OC coho may result from the high sound pressures produced when driving piles with an impact hammer. Impact driving of steel piles can produce intense sound pressure waves that can injure and kill fishes (Stadler, pers. comm. 2003, phone conversation regarding effects of sound pressure waves on fish; Desjardin 2003, pers. comm. e-mail regarding sound pressure wave effects). The injuries caused by such pressure waves are known as barotraumas, and include hemorrhage and rupture of internal organs, including the swimbladder and kidneys in fish, and damage to the auditory system. Death can be instantaneous, occur within minutes after exposure, or occur several days later. Fishes with swimbladders (which include salmonids) are sensitive to underwater impulsive sounds ie. sounds with a sharp sound pressure peak occurring in a short interval of time, because of swimbladder resonance, which is believed to occur in the frequency band of most sensitive hearing (usually 200 to 800 Hz) (Caltrans 2002). As the pressure wave passes through a fish, the swimbladder is rapidly squeezed due to the high pressure and then rapidly expanded as the underpressure component of the wave passes through the fish. The pneumatic pounding may result in the rupture of capillaries in the internal organs as indicated by observed blood in the abdominal cavity, and maceration of the kidney tissues (Caltrans 2002).

Another mechanism of injury and death is “rectified diffusion”, which is the formation and growth of bubbles in tissue caused by regions of high sound pressure levels. Hastings (2002) expects little to no physical damage to aquatic animals for peak sound pressures below 190 decibels (dB) (re: 1 Pascal), the threshold for rectified diffusion. However, much uncertainty exists as to the level of adverse effects to fish exposed to sound between 180 and 190 dB_{peak} due to species-specific variables. Based on this information, NOAA Fisheries has established the threshold for physical harm at 180 dB_{peak} for this project.

Sound pressure levels expressed as “root-mean-squared” (rms) values are commonly used in behavioral studies. Sound pressure levels in excess of 150 dB_{rms} are expected to cause temporary behavioral changes such as elicitation of a startle response or behavior associated with stress. These sound pressure levels are not expected to cause direct permanent injury, but, as discussed above, may decrease a fish’s ability to avoid predators. Observations by Feist, *et al.* (1992) suggest that sound levels in this range may disrupt normal migratory behavior of juvenile salmon. They also noted that when exposed to the sounds from pile driving, juvenile pink and chum salmon were less likely to startle and flee when approached by an observer than were those that were shielded from the sounds. Based on this information, NOAA Fisheries has established the threshold for behavioral disruption at 150 dB_{rms} for this project.

Driving hollow steel piles of the size proposed for this project can produce sound pressure levels measured at 10m from the pile, over 180 dB_{peak} and 150 rms (Stadler 2003, pers. comm.,phone conversation regarding effects of sound pressure waves on fish). Clearly, these sound pressure levels are sufficiently high to present a lethal threat to fishes, as evidenced by the number of species, including salmonids, killed during impact driving of 24, 36-inch diameter steel piles (Stadler, pers. obs. 2002, phone conversation regarding effects of sound pressure waves on fish; Desjardin, pers. comm.2003, e-mail regarding sound pressure wave effects). Vibratory hammers produce peak pressures that are approximately 17 dB lower than those from impact hammers (Nedwell and Edwards 2002) yielding an estimated peak sound pressure level of 193 dB for the piles used in this project. While this is above the threshold for physical injury (180 dB), no fish-kills have been linked to the use of vibratory hammers. The lack of evidence does not mean that vibratory hammers are harmless, but they are likely, less harmful than impact hammers.

The sounds from the two types of hammer differ not only in intensity, but also in frequency and impulse energy (the rate at which the pressure rises) as well. Most of the sound energy of impact hammers is concentrated between 100 and 800 Hz, the frequencies thought to be most harmful to fishes, while the sound energy from the vibratory hammer is concentrated around 20 to 30 Hz.

Just as these two sounds are different, so are the behavioral responses of fishes to them. Most of the energy in the sounds produced by vibratory hammers is at the frequency of vibration, around 20 to 30 Hz, very near the range of infrasound (less than 20 Hz). The response to impact hammers is, however, quite different. Fishes may react to the first few strikes of an impact hammer with a "startle" response. After these initial strikes, the startle response wanes and the fishes may remain within the field of a potentially harmful sound (NOAA Fisheries 2001). Thus, impact hammers may be more harmful than vibratory hammers for two reasons: (1) Impact hammers produce pressure waves with greater potential to harm fishes; and (2) the sounds produced do not elicit an avoidance response in fishes, which will expose them for longer periods to those harmful pressures.

Most reports of fish-kills associated with pile driving are limited to those fishes that were immediately killed and floated to the surface. However, physical harm to juvenile salmonids is not always expected to result in immediate, mortal injury – death may occur several hours or days later, while other injuries may be sublethal.

Small fishes that are subjected to high sound pressure levels may also be more vulnerable to predation, and the predators, themselves, may be drawn into the potentially harmful field of sound by following injured prey. The California Department of Transportation (cited in NOAA Fisheries 2003) reported that the stomach of a striped bass killed by pile driving contained several freshly consumed juvenile herring. It appears this striped bass was feeding heavily on killed, injured, or stunned herring as it, too, swam into the zone of lethal sound pressure. Due to their piscivorous nature, adult salmonids may be drawn to an area of dangerously high sound pressure level by the smaller fishes that are injured or killed.

Not all fishes killed by pile driving float to the surface. With few exceptions, fish-kills are reported only when dead and injured fishes are observed at the surface. Thus, the frequency and magnitude of such kills may be underestimated.

The effects to fishes of the high sound pressure levels produced by impact driving of steel piles depend on several factors, including the size and species of fish. At Bremerton, WA, approximately 100 surf perches (*Cymatogaster aggregata* and *Embiotoca lateralis*) were killed during impact driving of 30-inch diameter steel pilings (Stadler, pers. obs. 2003). The size of these fish ranged from 70-mm to 175-mm fork length. Dissections revealed that the swimbladders of the smallest of the fishes (80mm fork length) were completely destroyed, while those of the largest individual (170mm fork length) were nearly intact. Damage to the swimbladder of *C. aggregata* was more was more severe than to similar sized *E. lateralis*. These results indicate size and species-specific differences.

The potential for injury to fishes from pile driving depends on the type and intensity of the sounds produced. These are greatly influenced by a variety of factors, including the type of hammer, the type of substrate and the depth of the water. Firmer substrates require more energy to drive piles into, and produce more intense sound pressures.

To minimize the potential risk to juvenile OC coho and adults, ODOT will use a bubble curtain to attenuate the sound pressure waves. The efficacy of a bubble curtain is dependent upon the current regime where they are used. Currents above 1.6 kts can disperse the bubbles downstream, away from the pile. Stream currents are likely to be below the 1.6 kts, however, if they are above that threshold a confined bubble curtain will be used. Deployment of a bubble curtain is expected to attenuate the peak sound pressure levels by approximately 20 dB (a 90% reduction in sound energy). However, a bubble curtain may not bring the peak and rms sound pressure levels below the established thresholds, and some low level of take may still occur.

Any fish in the area that are not buffered by the sound attenuation devices will be affected. The expected low numbers of the smallest, OC coho, based on discussions with ODFW, at the time of pile driving and the assumption that larger juvenile and adult OC coho are less affected by the behavioral changes brought by pile driving, leads NOAA Fisheries to believe that this activity will have minimal adverse effect to listed salmonids with sound attenuation devices in place.

Riparian Vegetation

Woody riparian vegetation provides large wood to the stream, which encourages the creation of rearing and spawning areas. Riparian vegetation also provides water quality functions (*e.g.* temperature control and nutrient transformation), bank stability, detritus (insect and leaf input, small wood for substrate for insects, *etc.*), microclimate formation, floodplain sediment retention and vegetative filtering, and recharge of the stream hyporheic zone.

There will be some vegetation removal, but avoidance of vegetation will be an objective when gaining access or completing work near the river, streams or wetlands. However, this project, which is "at risk" for riparian vegetation, would provide a long-term increase in the quality of the riparian habitat in the project vicinity through implementation of mitigation activities.

During construction, erosion control measures and post-project riparian plantings will reduce erosion during construction and restore woody vegetation. All impacted areas will be restored to pre-work conditions. Damaged streambanks will be restored to a natural slope, pattern and profile suitable for establishment of permanent woody vegetation. All exposed soil surfaces, including construction access roads and associated staging areas, will be stabilized mulch, native herbaceous seeding, and native woody vegetation. The riparian plantings will provide bank stabilization, shading, and increase the potential for insect production.

Vegetation removal carries many of the same potential effects as wetland loss. The majority of the vegetation proposed for removal as a result of the proposed project is composed of non-native shrub and forb species. Construction of the proposed Neawanna and Dooley Bridges will require removal of a small amount of riparian vegetation beside the both bridges' ends.

In the immediate project vicinity, most of the vegetation has been extensively disturbed by human activities. The largest portion of the project area dominated by natural vegetation is a forested area associated with the unnamed tributary of the Necanicum River in the southern section of the project. This area is characterized by a stand of red alder (*Alnus rubra*) and willows (*Salix spp.*) with some patches of Sitka spruce or Douglas-fir in the overstory. Common native shrub species such as salal, ocean spray (*Holodiscus discolor*), wild rose (*Rosa spp*.) and Pacific ninebark (*Physocarpus capitatus*) can be found on disturbed sites or in landscaped areas throughout the project corridor.

<u>Dissolved Oxygen</u>
Construction and pile driving can suspend fine sediments potentially creating short term pulses of turbidity, especially during incoming tides. This could decrease dissolved oxygen in the water column due to higher biological oxygen demand (BOD) in the re-suspended sediments. Decreases in dissolved oxygen have been shown to adversely affect swimming performance in salmonid fishes (Bjornn and Reiser 1991). Reductions in dissolved oxygen could delay or slow immigration of adult coho salmon into the Necanicum River and Neawanna Creek and displace rearing juvenile salmon. NOAA Fisheries expects only minor effects on oxygen concentrations due to the limited work being done instream, isolation of the work areas, and to the seasonal restriction that will limit construction to the time of year that BOD is likely to be low.

<u>Chemical Contamination</u>
As with all construction activities, accidental release of fuel, oil, and other contaminants may occur. Operation of the back-hoes, excavators, and other equipment requires the use of fuel, lubricants, *etc.*, which, if spilled into the channel of a waterbody or into the adjacent riparian zone, can injure or kill aquatic organisms. Petroleum-based contaminants, such as fuel, oil, and some hydraulic fluids, contain poly-cyclic aromatic hydrocarbons (PAHs), which can be acutely toxic to salmonids at high levels of exposure and can also cause chronic lethal and acute and chronic sublethal effects to aquatic organisms (Neff 1985).

The Necanicum River is not properly functioning for chemical contaminants. This project is expected to maintain or improve this parameter. To minimize the potential for chemical contamination and disturbance of fish, most of the project work will occur during the ODFW-preferred in-water work timing guideline. During this window, streamflow is typically low, fish presence is reduced, and rainfall is minimal. In-water work area isolation will allow the work to occur in the dry, thereby reducing indirect (chemical contaminants) from entering the actively flowing water and direct impacts to fish. Staging areas will be in areas that have already been previously disturbed.

<u>Total Suspended Solids and Turbidity</u>
Potential effects from project-related increases in turbidity on OC coho salmon include, but are not limited to: (1) Reduction in feeding rates and growth; (2) increased mortality; (3) physiological stress; (4) behavioral avoidance; (5) reduction in macroinvertebrate populations; and (6) temporary beneficial effects. Potential beneficial effects include a reduction

in piscivorous fish/bird predation rates, enhanced cover conditions, and improved survival conditions.

Turbidity is defined as a measurement of relative clarity due to an increase in dissolved or suspended, undissolved particles. At moderate levels, turbidity can reduce primary and secondary productivity and, at high levels, has the potential to interfere with feeding and to injure and kill adult and juvenile fish (Spence *et al.* 1996, Bjornn and Reiser 1991). Other behavioral effects on fish, such as gill flaring and feeding changes, have been observed in response to pulses of suspended sediment (Berg and Northcote 1985). Fine, redeposited sediments can also reduce primary and secondary productivity (Spence *et al.* 1996), and reduce incubation success and interstitial rearing space for juvenile salmonids (Bjornn and Reiser 1991). Salmonid fishes have been observed to move laterally and downstream to avoid turbid plumes (Sigler *et al.* 1984, Lloyd 1987, Servizi and Martens 1991). Juvenile salmonid fishes tend to avoid streams that are chronically turbid, such as glacial streams or those disturbed by human activities, except when the fish must traverse these streams along migration routes (Lloyd *et al.* 1987). In addition, a potential positive effect is providing refuge and cover from predation. Fish that remain in turbid waters experience a reduction in predation from piscivorous fish and birds (Gregory and Levings 1998). In habitats with intense predation pressure, this provides a beneficial trade-off of enhanced survival in exchange for physical effects such as reduced growth.

Exposure duration is a critical determinant of the occurrence and magnitude of physical or behavioral effects (Newcombe and MacDonald 1991). Salmonid fishes have evolved in waters that periodically experience short-term pulses (days to weeks) of high suspended sediment loads, often associated with floods, and are adapted to such high pulse exposures. Adult and larger juvenile salmonid fishes appear to be little affected by the high concentrations of suspended sediments that occur during storm and snowmelt runoff episodes (Bjornn and Reiser 1991). However, chronic exposure can cause physiological stress that can increase maintenance energy and reduce feeding and growth (Redding *et al.* 1987, Lloyd 1987, Servizi and Martens 1991).

Increases in TSS can adversely affect filter-feeding macroinvertebrates and fish feeding. At concentrations of 53 to 92 ppm (24 hours) macroinvertebrate populations were reduced (Gammon 1970). Concentrations of 250 ppm (1 hour) caused a 95% reduction in feeding rates in juvenile coho salmon (Noggle 1978). Concentrations of 1200 ppm (96 hours) killed juvenile coho salmon (Noggle 1978). Concentrations of 53.5 ppm (12 hours) caused physiological stress and changes in behavior in coho salmon (Berg 1983).

The Necanicum River is not properly functioning for sediment and turbidity. This project is expected to maintain or improve this parameter. The proposed bridge construction and demolition will potentially increase turbidity upstream (due to incoming tides) and downstream of the work area for short periods during the tidal cycle. These increases in turbidity are likely to increase physiological stress and displace rearing juveniles. Salmon are likely to avoid waters that are chronically turbid, and therefore adverse effects are less likely after initial exposure; however, repeated pulses of turbidity that persist over a period of days or weeks may displace rearing salmon for longer periods, possibly reducing survival. Construction during the proposed in-water work window, November 1 through February 15, is likely to minimize the above effects on 0+ age juvenile salmon in the action area as abundance with this age class is likely low during this time of year. However, 0+ age juvenile salmon present in the action area exposed to chronically turbid waters are likely to be injured or killed. One+ age juvenile salmon are more likely to be present in the action area in low to moderate abundance. While more adapted to turbid waters, 1+ age juvenile salmon likely would be exposed to increases in turbidity during this time of year when background turbidity is high, and likely would experience increased physiological stress and potentially physical injury (*e.g.*, gill abrasion).

2.1.5.2 Cumulative Effects

Cumulative effects are defined in 50 CFR 402.02 as "those effects of future State or private activities, not involving Federal activities, that are reasonably certain to occur within the action area of the Federal action subject to consultation."

NOAA Fisheries is not aware of any specific future non-federal activities within the action area that would cause greater effects to listed species than presently occurs. The action area includes significant tracts of private and state lands. Land use on these non-federal lands include rural development, agricultural, commercial development and commercial forestry. Chemical fertilizers or pesticides are used on many of these lands, but no specific information is available regarding their use. Furthermore, NOAA Fisheries generally does not consider the rules governing timber harvests, agricultural practices, and rural development on non-federal lands within Oregon to be sufficiently protective of watershed, riparian, and stream habitat functions to support the survival and recovery of listed species. Therefore, these habitat functions likely are at risk due to future activities on non-federal forest lands within the basin.

Non-federal activities within the action area are expected to increase due to a projected 14.7% increase in human population by the year 2024 in Clatsop County (EPA 2000). Thus, NOAA Fisheries assumes that future private and state actions will continue within the action area, increasing as population density rises.

2.1.6 Conclusion

The next step in NOAA Fisheries' approach to determine jeopardy is to determine whether the proposed action, in light of the above factors, is likely to appreciably reduce the likelihood of the species' survival and recovery in the wild. For the jeopardy determination, NOAA Fisheries uses the consultation regulations, and its Habitat Approach (NOAA Fisheries 1999) to determine whether actions would further degrade the environmental baseline or hinder attainment of PFC at a spatial scale relevant to the listed ESU. That is, because the OC coho salmon ESU consists of groups of populations that inhabit geographic areas ranging in size from less than ten to several thousand square miles, the analysis must be applied at a spatial resolution wherein the actual effects of the action upon the species can be determined.

After reviewing the best available scientific and commercial information available regarding the current status of the OC coho salmon ESU, the environmental baseline for the action area, the effects of the proposed action, and cumulative effects, NOAA Fisheries concludes that the action, as proposed, is not likely to jeopardize the continued existence of OC coho salmon.

Our conclusion is based on the following considerations: (1) All in-water work will occur at a time of year when abundance of juvenile OC coho salmon is low; (2) any in-water work will be isolated and any fish present removed from the work area; (3) any reductions of dissolved oxygen will be short-lived; (4) all stormwater will be treated using adequate treatment facilities; and (5) the effects of this action are not likely to impair currently properly functioning habitats, appreciably reduce the functioning of already impaired habitats, or retard the long-term progress of impaired habitats toward proper functioning condition essential to the long-term survival and recovery at the population or ESU scale.

2.1.7 Reinitiation of Consultation

As provided in 50 CFR 402.16, reinitiation of formal consultation is required where discretionary Federal agency involvement or control over the action has been retained (or is authorized by law) and if: (1) The amount or extent of taking specified in the incidental take statement is exceeded, or is expected to be exceeded; (2) new information (*e.g.*, monitoring, modeling) reveals effects of the action may affect listed species in a way not previously considered; (3) the action is modified in a way that causes an effect on listed species that was not previously considered; or (4) a new species is listed or critical habitat is designated that may be affected by the action. In instances where the amount or extent of incidental take is exceeded, any operations causing such take must cease pending conclusion of the reinitiated consultation.

2.2 Incidental Take Statement

The ESA at section 9 [16 USC 1538] prohibits take of endangered species. The prohibition of take is extended to threatened anadromous salmonids by section 4(d) rule [50 CFR 223.203]. Take is defined by the statute as "to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct." [16 USC 1532(19)] Harm is defined by regulation as "an act which actually kills or injures fish or wildlife. Such an act may include significant habitat modification or degradation which actually kills or injures fish or wildlife by significantly impairing essential behavior patterns, including, breeding, spawning, rearing, migrating, feeding or sheltering." [50 CFR 222.102] Harass is defined as "an intentional or negligent act or omission which creates the likelihood of injury to wildlife by annoying it to such an extent as to significantly disrupt normal behavior patterns which include, but are not limited to, breeding, feeding, or sheltering." [50 CFR 17.3] Incidental take is defined as "takings that result from, but are not the purpose of, carrying out an otherwise lawful activity conducted by the Federal agency or applicant." [50 CFR 402.02] The ESA at section 7(o)(2) removes the prohibition from any incidental taking that is in compliance with the terms and conditions specified in a section 7(b)(4) incidental take statement [16 USC 1536].

2.2.1 Amount or Extent of Take

The proposed action covered by this Opinion is reasonably certain to result in incidental take of listed species due to changes in physical habitat, fish harassment, suspension of sediments, temporary changes in water quality, and reduction in benthic prey resources. Effects of actions such as these are largely unquantifiable in the short term, but are likely to be largely limited to harm in the form of injury and behavior modification. Therefore, even though NOAA Fisheries expects some low level of incidental take to occur due to the action covered by this Opinion, the best scientific and commercial data available are not sufficient to enable it to estimate a specific amount of incidental take. In instances such as this, NOAA Fisheries designates the expected level of take in terms of the extent of take allowed. Therefore, the extent of take for this opinion is limited to take resulting from activities undertaken as described in this Opinion that occurs in the action area, which includes all marine and riverine habitats accessible to OC coho salmon in the Neawanna Creek from the confluence with the Necanicum River upstream to the uppermost extent of turbidity on an incoming tide. NOAA Fisheries expects the possibility exists for incidental take of up to 50 juvenile OC coho salmon during work area isolation and handling of fish. Incidental take occurring due to modifications to the proposed action or beyond the area described is not authorized by this consultation.

2.2.2 Reasonable and Prudent Measures

The measures described below are non-discretionary. They must be implemented so that they become binding conditions in order for the exemption in section 7(a)(2) to apply. The FHWA has the continuing duty to regulate the activities covered in this incidental take statement. If the FHWA fails to adhere to the terms and conditions of the incidental take statement through enforceable terms added to the document authorizing this action, or fails to retain the oversight to ensure compliance with these terms and conditions, the protective coverage of section 7(o)(2) may lapse.

NOAA Fisheries believes that the following reasonable and prudent measures along with conservation measures described in the BA are necessary and appropriate to minimize the likelihood of take of listed fish resulting from implementation of this Opinion.

The FHWA shall:

1. Minimize incidental take from general construction by applying conditions to the proposed action that avoid or minimize adverse effects to riparian and aquatic systems.

2. Ensure completion of a comprehensive monitoring and reporting program to confirm this Opinion is meeting its objective of minimizing take from the proposed action.

2.2.3 Terms and Conditions

These measures should be incorporated into construction contracts and subcontracts to ensure that the work is carried out in the manner prescribed.

1. To implement reasonable and prudent measure #1 (general conditions for construction, operation and maintenance), the FHWA shall ensure that:

   a. Timing of in-water work. Work within the active channel of Neawanna Creek and Mill Creek will be completed during the period of November 1 to February 28. Work within the active channel of the unnamed tributary to the Necanicum River will be completed during the period of July 1 to September 15. All work must be completed within these dates unless otherwise approved in writing by NOAA Fisheries.

   b. Minimum Area. Confine construction impacts to the minimum area necessary to complete the project.

   c. Cessation of work. Project operations will cease under high flow conditions that may result in inundation of the project area, except for efforts to avoid or minimize resource damage.

   d. Fish screens. All water intakes used for a project, including pumps used to isolate an in-water work area, will have a fish screen installed, operated and maintained according to NOAA Fisheries' fish screen criteria.[1]

   e. Fish passage. Passage will be provided for any adult or juvenile salmonid species present in the project area during construction, and after construction for the life of the project. Upstream passage is not required during construction if it did not previously exist.

   f. Pollution and Erosion Control Plan. A pollution and erosion control plan will be prepared and carried out to prevent pollution related to construction operations. The plan must be available for inspection on request by FHWA or NOAA Fisheries.

      i. Plan Contents. The pollution and erosion control plan must contain the pertinent elements listed below, and meet requirements of all applicable laws and regulations.

         (1) Practices to prevent erosion and sedimentation associated with access roads, stream crossings, construction sites, borrow pit operations, haul roads, equipment and material storage sites, fueling operations and staging areas.

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[1] National Marine Fisheries Service, *Juvenile Fish Screen Criteria* (revised February 16, 1995) and *Addendum: Juvenile Fish Screen Criteria for Pump Intakes* (May 9, 1996) (guidelines and criteria for migrant fish passage facilities, and new pump intakes and existing inadequate pump intake screens) (http://www.nwr.noaa.gov/1hydrop/hydroweb/ferc.htm).

(2) Practices to confine, remove and dispose of excess concrete, cement and other mortars or bonding agents, including measures for washout facilities.

(3) A description of any hazardous products or materials that will be used for the project, including procedures for inventory, storage, handling, and monitoring.

(4) A spill containment and control plan with notification procedures, specific clean up and disposal instructions for different products, quick response containment and clean up measures that will be available on the site, proposed methods for disposal of spilled materials, and employee training for spill containment.

(5) Practices to prevent construction debris from dropping into any stream or waterbody, and to remove any material that does drop with a minimum disturbance to the streambed and water quality.

ii. Inspection of erosion controls. During construction, all erosion controls must be inspected daily during the rainy season and weekly during the dry season to ensure they are working adequately.[2]

(1) If inspection shows that the erosion controls are ineffective, work crews must be mobilized immediately to make repairs, install replacements, or install additional controls as necessary.

(2) Sediment must be removed from erosion controls once it has reached 1/3 of the exposed height of the control.

g. Construction discharge water. All discharge water created by construction (*e.g.*, concrete washout, pumping for work area isolation, vehicle wash water) will be treated as follows:

i. Water quality. Facilities must be designed, built and maintained to collect and treat all construction discharge water using the best available technology applicable to site conditions. The treatment must remove debris, nutrients, sediment, petroleum hydrocarbons, metals and other pollutants likely to be present.

ii. Discharge velocity. If construction discharge water is released using an outfall or diffuser port, velocities must not exceed 4 feet per second.

iii. Spawning areas, marine submerged vegetation. No construction discharge water may be released within 300 feet upstream of active spawning areas or areas with marine submerged vegetation.

h. Preconstruction activity. Before significant[3] alteration of the project area, the following actions must be completed:

i. Marking. Flag the boundaries of clearing limits associated with site access and construction to prevent ground disturbance of critical riparian

[2] "Working adequately" means no turbidity plumes are evident during any part of the year.

[3] "Significant" means an effect can be meaningfully measured, detected or evaluated.

vegetation, wetlands and other sensitive sites beyond the flagged boundary.

ii. Emergency erosion controls. Ensure that the following materials for emergency erosion control are onsite:

(1) A supply of sediment control materials (*e.g.*, silt fence, straw bales[4]).

(2) An oil-absorbing, floating boom whenever surface water is present.

iii. Temporary erosion controls. All temporary erosion controls must be in-place and appropriately installed downslope of project activity within the riparian area until site restoration is complete.

i. Temporary access roads.

i. Existing ways. Existing roadways or travel paths must be used whenever possible, unless construction of a new way would result in less habitat take.

ii. Steep slopes. Temporary roads built mid-slope or on slopes steeper than 30% are not authorized.

iii. Minimizing soil disturbance and compaction. When a new temporary road is necessary within 150 feet[5] of a stream, waterbody or wetland, soil disturbance and compaction must be minimized by clearing vegetation to ground level and placing clean gravel over geotextile fabric, unless otherwise approved in writing by NOAA Fisheries.

iv. Temporary stream crossings.

(1) The number of temporary stream crossings must be minimized.

(2) Temporary road crossings must be designed as follows:

(a) A survey must identify and map any potential spawning habitat within 300 feet downstream of a proposed crossing.

(b) No stream crossing may occur at known or suspected spawning areas, or within 300 feet upstream of such areas if spawning areas may be affected.

(c) The crossing design must provide for foreseeable risks (*e.g.*, flooding and associated bedload and debris) to prevent the diversion of streamflow out of the channel and down the road if the crossing fails.

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[4] When available, certified weed-free straw or hay bales must be used to prevent introduction of noxious weeds.

[5] Distances from a stream or waterbody are measured horizontally from, and perpendicular to, the bankfull elevation, the edge of the channel migration zone, or the edge of any associated wetland, whichever is greater. "Channel migration zone" means the area defined by the lateral extent of likely movement along a stream reach as shown by evidence of active stream channel movement over the past 100 years, *e.g.*, alluvial fans or floodplains formed where the channel gradient decreases, the valley abruptly widens, or at the confluence of larger streams.

(d) Vehicles and machinery must cross riparian areas and streams at right angles to the main channel wherever possible.

v. Obliteration. When the project is completed, all temporary access roads and work bridges must be obliterated, the soil must be stabilized, and the site must be revegetated. Temporary roads in wet or flooded areas must be abandoned and restored as necessary by the end of the in-water work period.

j. Heavy Equipment. Use of heavy equipment will be restricted as follows:

i. Choice of equipment. When heavy equipment must be used, the equipment selected must have the least adverse effects on the environment (*e.g.*, minimally-sized, rubber-tired).

ii. Vehicle staging. Vehicles must be fueled, operated, maintained, and stored as follows:

(1) Vehicle staging, cleaning, maintenance, refueling, and fuel storage must take place in a vehicle staging area placed 150 feet or more from any stream, waterbody or wetland.

(2) All vehicles operated within 150 feet of any stream, waterbody or wetland must be inspected daily for fluid leaks before leaving the vehicle staging area. Any leaks detected must be repaired in the vehicle staging area before the vehicle resumes operation. Inspections must be documented in a record that is available for review on request by FHWA or NOAA Fisheries.

(3) All equipment operated instream must be cleaned before beginning operations below the bankfull elevation to remove all external oil, grease, dirt, and mud.

(4) The temporary work bridges shall be constructed to ensure full containment of any spills and/or leaks.

iii. Stationary power equipment. Stationary power equipment (*e.g.*, generators, cranes) operated within 150 feet of any stream, waterbody or wetland must be diapered to prevent leaks, unless otherwise approved in writing by NOAA Fisheries.

k. Site preparation. Native materials will be conserved for site restoration.

i. If possible, native materials must be left where they are found.

ii. Materials that are moved, damaged or destroyed must be replaced with a functional equivalent during site restoration.

iii. Any large wood,[6] native vegetation, weed-free topsoil, and native channel material displaced by construction must be stockpiled for use during site restoration.

l. Isolation of in-water work area. If adult or juvenile fish are reasonably certain to be present, the work area will be well isolated from the active flowing stream using inflatable bags, sandbags, sheet pilings, or similar materials. The work area will also be isolated if in-water work may occur within 300 feet upstream of spawning habitats.

m. Capture and release. Before and intermittently during pumping to isolate an in-water work area, an attempt must be made to capture and release fish from the isolated area using trapping, seining, electrofishing, or other methods as are prudent to minimize risk of injury.

i. A fishery biologist experienced with work area isolation and competent to ensure the safe handling of all ESA-listed fish must conduct or supervise the entire capture and release operation.

ii. If electrofishing equipment is used to capture fish, the capture team must comply with NOAA Fisheries' electrofishing guidelines.[7]

iii. The capture team must handle ESA-listed fish with extreme care, keeping fish in water to the maximum extent possible during seining and transfer procedures to prevent the added stress of out-of-water handling.

iv. Captured fish must be released as near as possible to capture sites.

v. ESA-listed fish may not be transferred to anyone except NOAA Fisheries personnel, unless otherwise approved in writing by NOAA Fisheries.

vi. Other Federal, state, and local permits necessary to conduct the capture and release activity must be obtained.

vii. NOAA Fisheries or its designated representative must be allowed to accompany the capture team during the capture and release activity, and must be allowed to inspect the team's capture and release records and facilities.

n. Earthwork. Earthwork (including drilling, excavation, dredging, filling and compacting) will be completed as quickly as possible.

i. Site stabilization. All disturbed areas must be stabilized, including obliteration of temporary roads, within 12 hours of any break in work unless construction will resume work within seven days between June 1 and September 30, or within two days between October 1 and May 31.

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[6] For purposes of this Opinion only, "large wood" means a tree, log, or rootwad big enough to dissipate stream energy associated with high flows, capture bedload, stabilize streambanks, influence channel characteristics, and otherwise support aquatic habitat function, given the slope and bankfull width of the stream in which the wood occurs. See, Oregon Department of Forestry and Oregon Department of Fish and Wildlife, *A Guide to Placing Large Wood in Streams*, May 1995 (www.odf.state.or.us/FP/RefLibrary/LargeWoodPlacemntGuide5-95.doc).

[7] National Marine Fisheries Service, *Backpack Electrofishing Guidelines* (December 1998) (http://www.nwr.noaa.gov/1salmon/salmesa/pubs/electrog.pdf).

ii. Source of materials. Boulders, rock, woody materials and other natural construction materials used for the project must be obtained outside the riparian area.

o. Site restoration. All streambanks, soils and vegetation disturbed by the project are cleaned up and restored as follows:

i. Restoration goal. The goal of site restoration is renewal of habitat access, water quality, production of habitat elements (such as large woody debris), channel conditions, flows, watershed conditions and other ecosystem processes that form and maintain productive fish habitats.

ii. Streambank shaping. Damaged streambanks must be restored to a natural slope, pattern and profile suitable for establishment of permanent native woody vegetation.

iii. Revegetation. Areas requiring revegetation must be replanted before the first April 15 following construction with a diverse assemblage of species that are native to the project area or region, including grasses, forbs, shrubs and trees.

iv. Pesticides. No pesticide application is allowed, although mechanical or other methods may be used to control weeds and unwanted vegetation.

v. Fertilizer. No surface application of fertilizer may occur within 50-feet of any stream channel.

vi. Fencing. Fencing must be installed as necessary to prevent access to revegetated sites by livestock or unauthorized persons.

p. Treated wood.

i. Projects using treated wood[8] that may contact flowing water or that will be placed over water where it will be exposed to mechanical abrasion or where leachate may enter flowing water are not authorized, except for pilings installed following NOAA Fisheries' guidelines.[9] Treated wood pilings must incorporate design features to minimize abrasion of the treated wood from vessels, floats or other objects that may cause abrasion of the piling. (Some alternatives to using treated wood and be found at the following links: http://www.usplasticlumber.com http://www.interstor.com/earthcare/; http://www.smartdeck.com; http://www.envirowood.com; http://plastival.com/polyexhomepage.htm and http://www.trex.com)

ii. Projects that require removal of treated wood will use the following precautions:

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[8] 'Treated wood' means lumber, pilings, and other wood products preserved with alkaline copper quaternary (ACQ), ammoniacal copper arsenate (ACA), ammoniacal copper zinc arsenate (ACZA), copper naphthenate, chromated copper arsenate (CCA), pentachlorophenol, or creosote.

[9] Letter from Steve Morris, National Marine Fisheries Service, to W.B. Paynter, Portland District, U.S. Army Corps of Engineers (December 9, 1998) (transmitting a document titled *Position Document for the Use of Treated Wood in Areas within Oregon Occupied by Endangered Species Act Proposed and Listed Anadromous Fish Species, National Marine Fisheries Service, December 1998*).

(1) Treated wood debris. Take care to ensure that no treated wood debris falls into the water. If treated wood debris does fall into the water, remove it immediately.

(2) Disposal of treated wood debris. Dispose of all treated wood debris removed during a project, including treated wood pilings, at an upland facility approved for hazardous materials of this classification. Do not leave a treated wood piling in the water or stacked on the streambank.

q. Pile Driving.

i. The number and diameter of the pilings are minimized, as appropriate, without reducing the structural integrity.

ii. The FHWA shall ensure that, providing substrate conditions are appropriate, vibratory hammers are used to drive piles when possible. If substrate conditions are not appropriate, impact hammers may be used. Impact hammers will require the use of a bubble curtain.

iii. Drive each piling as follows to minimize the use of force and resulting sound pressure.

(1) When impact drivers will be used to install a pile, use the smallest driver and the minimum force necessary to complete the job. Use a drop hammer or a hydraulic impact hammer, whenever feasible and set the drop height to the minimum necessary to drive the piling.

(2) When using an impact hammer to drive or proof steel piles, one of the following sound attenuation devices will be used to reduce sound pressure levels by 20 dB.

(3) Place a block of wood or other sound dampening material between the hammer and the piling being driven.

(4) If currents are 1.7 miles per hour or less, surround the piling being driven by an unconfined bubble curtain that will distribute small air bubbles around 100% of the piling perimeter for the full depth of the water column.[10]

(5) If currents greater than 1.7 miles per hour, surround the piling being driven by a confined bubble curtain (*e.g.*, a bubble ring surrounded by a fabric or metal sleeve) that will distribute air bubbles around 100% of the piling perimeter for the full depth of the water column.

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[10] For guidance on how to deploy an effective, economical bubble curtain, see, Longmuir, C. and T. Lively, *Bubble Curtain Systems for Use During Marine Pile Driving*, Fraser River Pile and Dredge LTD, 1830 River Drive, New Westminster, British Columbia, V3M 2A8, Canada. Recommended components include a high volume air compressor that can supply more than 100 pounds per square inch at 150 cubic feet per minute to a distribution manifold with 1/16 inch diameter air release holes spaced every 3/4 inch along its length. An additional distribution manifold is needed for each 35 feet of water depth.

(6) Other sound attenuation devices as approved in writing by NOAA Fisheries.

iv. Piling removal. If a temporary or permanent piling will be removed, the following conditions apply:

(1) Dislodge the piling with a vibratory hammer.

(2) Once loose, place the piling onto the construction barge or other appropriate dry storage site.

(3) If a treated wood piling breaks during removal, either remove the stump by breaking or cutting 3 feet below the sediment surface or push the stump in to that depth, then cover it with a cap of clean substrate appropriate for the site, filling the holes left by each piling with clean, native sediments, whenever feasible.

r. Stormwater management. Prepare and carry out a written stormwater management plan for any project that will produce a new impervious surface or a land cover conversion that slows the entry of water into the soil. Submit a copy of the written plan to the FHWA and to the Oregon Office of NOAA Fisheries, at the address above, before beginning work below bankfull elevation.

i. Plan contents. The goal is to avoid and minimize adverse effects due to the quantity and quality of stormwater runoff for the life of the project by maintaining or restoring natural runoff conditions. The plan will meet the following criteria and contain the pertinent elements listed below, and meet requirements of all applicable laws and regulations.

(1) A system of management practices and, if necessary, structural facilities, designed to complete the following functions:

(a) Minimize, disperse and infiltrate stormwater runoff onsite using sheet flow across permeable vegetated areas to the maximum extent possible without causing flooding, erosion impacts, or long-term adverse effects to groundwater.

(b) Pretreat stormwater from pollution generating surfaces, including bridge decks, before infiltration or discharge into a freshwater system, as necessary to minimize any nonpoint source pollutant (*e.g.*, debris, sediment, nutrients, petroleum hydrocarbons, metals).

(2) Install structural facilities outside wetlands or the riparian buffer area[11] whenever feasible, otherwise, provide compensatory mitigation to offset any long-term adverse effects.

(3) Document completion of the following activities according to a regular schedule for the operation, inspection and maintenance of all structural facilities and conveyance systems, in a log available for inspection on request by the FHWA and NOAA Fisheries.

(a) Inspect and clean each facility as necessary to ensure that the design capacity is not exceeded, heavy sediment discharges are prevented, and whether improvements in operation and maintenance are needed.

(b) Promptly repair any deterioration threatening the effectiveness of any facility.

(c) Post and maintain a warning sign on or next to any storm drain inlet that says, as appropriate for the receiving water, 'Dump No Waste - Drains to Ground Water, Streams, or Lakes.'

(d) Only dispose of sediment and liquid from any catch basin in an approved facility.

(6) As agreed to in project meetings, provide elevations and calculations for each stormwater treatment facility to NOAA Fisheries for approval before implementation. These calculations should demonstrate the effeciency of these facilities.

ii. Runoffs/discharge into a freshwater system. When stormwater runoff will be discharged directly into fresh surface water or a wetland, or indirectly through a conveyance system, the following requirements apply.

(1) Maintain natural drainage patterns and, whenever possible, ensure that discharges from the project site occur at the natural location.

(2) Use a conveyance system comprised entirely of manufactured elements (*e.g.*, pipes, ditches, outfall protection) that extends to the ordinary high water line of the receiving water.

(3) Stabilize any erodible elements of this system as necessary to prevent erosion.

[11] For purposes of this Opinion only, 'riparian buffer area' means land: (1) Within 150 feet of any natural water occupied by listed salmonids during any part of the year or designated as critical habitat; (2) within 100 feet of any natural water within 1/4 mile upstream of areas occupied by listed salmonids or designated as critical habitat and that is physically connected by an above-ground channel system such that water, sediment, or woody material delivered to such waters will eventually be delivered to water occupied by listed salmon or designated as critical habitat; and (3) within 50 feet of any natural water upstream of areas occupied by listed salmonids or designated as critical habitat and that is physically connected by an above-ground channel system such that water, sediment, or woody material delivered to such waters will eventually be delivered to water occupied by listed salmon or designated as critical habitat. 'Natural water' means all perennial or seasonal waters except water conveyance systems that are artificially constructed and actively maintained for irrigation.

(4) Do not divert surface water from, or increase discharge to, an existing wetland if that will cause a significant adverse effect to wetland hydrology, soils or vegetation.
(5) The velocity of discharge water released from an outfall or diffuser port may not exceed 4 feet per second, and the maximum size of any aperture may not exceed one inch.

2. To implement reasonable and prudent measure #2 (monitoring), the FHWA shall:

a. Implementation monitoring. Ensure that the permittee submits a monitoring report to the FHWA within 120 days of project completion describing the permittee's success meeting permit conditions. The monitoring report will include the following information:
i. Project identification
(1) Permittee name, permit number, and project name.
(2) Project location, including any compensatory mitigation site(s), by 5th field HUC and by latitude and longitude as determined from the appropriate USGS 7-minute quadrangle map.
(3) FHWA contact person.
(4) Starting and ending dates for work completed.
(a) Photo documentation. Photo of habitat conditions at the project and any compensation site(s), before, during, and after project completion.[12]
(b) Include general views and close-ups showing details of the project and project area, including pre and post construction.
(c) Label each photo with date, time, project name, photographer's name, and a comment about the subject.
ii. Other data. Additional project-specific data, as appropriate for individual projects.
(1) Work cessation. Dates work cessation was required due to high flows.
(2) Fish screen. Compliance with NOAA Fisheries' fish screen criteria.
(3) A summary of pollution and erosion control inspections, including any erosion control failure, hazardous material spill, and correction effort.
(4) Site preparation.
(a) Total cleared area – riparian and upland.
(b) Total new impervious area.

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[12] Relevant habitat conditions may include characteristics of channels, eroding and stable streambanks in the project area, riparian vegetation, water quality, flows at base, bankfull and over-bankfull stages, and other visually discernable environmental conditions at the project area, and upstream and downstream of the project.

(5) Isolation of in-water work area, capture and release.
   (a) Supervisory fish biologist – name and address.
   (b) Methods of work area isolation and take minimization.
   (c) Stream conditions before, during and within one week after completion of work area isolation.
   (d) Means of fish capture.
   (e) Number of fish captured by species.
   (f) Location and condition of all fish released.
      (g) Any incidence of observed injury or mortality.

(6) Site restoration.
   (a) Finished grade slopes and elevations.
   (b) Log and rock structure elevations, orientation, and anchoring (if any).
   (c) Planting composition and density.
   (d) A five-year plan to:
      (i) Inspect and, if necessary, replace failed plantings to achieve 100% survival at the end of the first year, and 80% survival or 80% coverage after five years (including both plantings and natural recruitment).
      (ii) Control invasive non-native vegetation.
      (iii) Protect plantings from wildlife damage and other harm.

b. Reporting. On an annual basis for five years after completing the project, the FHWA shall ensure submital of a monitoring report to NOAA Fisheries describing the applicant's success in meeting their habitat restoration goals of any riparian plantings. This report will consist of the following information:
   (i) Project identification.
      (a) Project name.
      (b) Starting and ending dates of work completed for this project.
      (c) The FHWA contact person.
   (ii) Riparian restoration. Documentation of the following conditions:
      (a) Any changes in planting composition and density.
      (b) A plan to inspect and, if necessary, replace failed plantings and structures.

   (iii) Monitoring reports will be submitted to:
      NOAA Fisheries
      Oregon State Habitat Office
      Attn: 2001/01028
      525 NE Oregon Street, Suite 500
      Portland, OR 97232-2778

c. NOTICE. If a sick, injured or dead specimen of a threatened or endangered species is found, the finder must notify the Vancouver Field Office of NOAA

Fisheries Law Enforcement at 360.418.4246. The finder must take care in handling of sick or injured specimens to ensure effective treatment, and in handling dead specimens to preserve biological material in the best possible condition for later analysis of cause of death. The finder also has the responsibility to carry out instructions provided by Law Enforcement to ensure that evidence intrinsic to the specimen is not disturbed unnecessarily.

3. MAGNUSON - STEVENS ACT

3.1 Background

The objective of the essential fish habitat (EFH) consultation is to determine whether the proposed action may adversely affect designated EFH for relevant species, and to recommend conservation measures to avoid, minimize, or otherwise offset potential adverse effects to EFH resulting from the proposed action.

3.2 Magnuson-Stevens Fishery Conservation and Management Act

The MSA, as amended by the Sustainable Fisheries Act of 1996 (Public Law 104-297), requires the inclusion of EFH descriptions in Federal fishery management plans. In addition, the MSA requires Federal agencies to consult with NOAA Fisheries on activities that may adversely affect EFH.

EFH means those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity (MSA §3). For the purpose of interpreting the definition of essential fish habitat: 'Waters' include aquatic areas and their associated physical, chemical, and biological properties that are used by fish and may include aquatic areas historically used by fish where appropriate; 'substrate' includes sediment, hard bottom, structures underlying the waters, and associated biological communities; 'necessary' means the habitat required to support a sustainable fishery and the managed species' contribution to a healthy ecosystem; and "spawning, breeding, feeding, or growth to maturity" covers a species' full life cycle (50CFR600.110).

Section 305(b) of the MSA (16 U.S.C. 1855(b)) requires that:

- Federal agencies must consult with NOAA Fisheries on all actions, or proposed actions, authorized, funded, or undertaken by the agency, that may adversely affect EFH;

- NOAA Fisheries shall provide conservation recommendations for any Federal or state activity that may adversely affect EFH;

- Federal agencies shall within 30 days after receiving conservation recommendations from NOAA Fisheries provide a detailed response in writing to NOAA Fisheries regarding the conservation recommendations. The response shall include a description of measures proposed by the agency for avoiding, mitigating, or offsetting the impact of the activity on EFH. In the case of a response that is inconsistent with the conservation recommendations of NOAA Fisheries, the Federal agency shall explain its reasons for not following the recommendations.

The MSA requires consultation for all actions that may adversely affect EFH, and does not distinguish between actions within EFH and actions outside EFH. Any reasonable attempt to encourage the conservation of EFH must take into account actions that occur outside EFH, such as upstream and upslope activities, that may have an adverse effect on EFH. Therefore, EFH consultation with NOAA Fisheries is required by Federal agencies undertaking, permitting or funding activities that may adversely affect EFH, regardless of its location.

3.3 Identification of EFH

The Pacific Fisheries Management Council (PFMC) has designated EFH for three species of Pacific salmon: Chinook (*Oncorhynchus tshawytscha*); coho (*O. kisutch*); and Puget Sound pink salmon (*O. gorbuscha*) (PFMC 1999). Freshwater EFH for Pacific salmon includes all those streams, lakes, ponds, wetlands, and other water bodies currently, or historically accessible to salmon in Washington, Oregon, Idaho, and California, except areas upstream of certain impassable man-made barriers (as identified by the PFMC), and longstanding, naturally-impassable barriers (*i.e.*, natural waterfalls in existence for several hundred years). Detailed descriptions and identifications of EFH for salmon are found in Appendix A to Amendment 14 to the *Pacific Coast Salmon Plan* (PFMC 1999). Assessment of potential adverse effects to these species' EFH from the proposed action is based on this information.

3.4 Proposed Actions

The proposed actions are detailed in section 1.2, Proposed Action. For this consultation, the action area includes all marine and riverine habitats accessible to OC coho salmon in the Neawanna Creek from the confluence with the Necanicum Rive to the uppermost extent of visible turbidity on incoming tides. This area has been designated as EFH for various life stages of coastal pelagic species, groundfish species, and chinook and coho salmon (Table 3).

3.5 Effects of Proposed Action

As described in detail in section 1.5, Analysis of Effects, the proposed activities may result in detrimental short-term adverse effects to a variety of habitat parameters. These effects include: Increases in turbidity, disturbance of the beds and banks of the river, removal of riparian vegetation and the potential for pollutants to enter the water. The proposed action will adversely affect water and sediment quality for coastal pelagic species, groundfish species, and chinook and coho salmon.

3.6 Conclusion

After reviewing the current status of the listed species, the environmental baseline for the action areas, the effects of the proposed bridge replacements, and cumulative effects, NOAA Fisheries has determined that the Pacific Way to Dooley Bridges Replacement Project, as proposed, will adversely affect the EFH for coastal pelagic species, groundfish species, and chinook and coho salmon in the action area.

3.7 EFH Conservation Recommendations

Pursuant to section 305(b)(4)(A) of the MSA, NOAA Fisheries is required to provide EFH conservation recommendations for any Federal or state agency action that would adversely affect EFH. The conservation measures proposed for the project by the FHWA in the BAs and all of the reasonable and prudent measures and the terms and conditions contained in sections 2.2 and 2.3 of this Opinion are applicable to salmon EFH. Therefore, NOAA Fisheries incorporates each of those measures here as EFH conservation recommendations.

3.8 Statutory Response Requirement

Please note that the MSA (section 305(b)) and 50 CFR 600.920(j) requires the Federal agency to provide a written response to NOAA Fisheries after receiving EFH conservation recommendations within 90 days of its receipt of this letter. This response must include a description of measures proposed by the agency to avoid, minimize, mitigate or offset the adverse impacts of the activity on EFH. If the response is inconsistent with a conservation recommendation from NOAA Fisheries, the agency must explain its reasons for not following the recommendation.

3.9 Supplemental Consultation

The FHWA must reinitiate EFH consultation with NOAA Fisheries if either the action is substantially revised or new information becomes available that affects the basis for NOAA Fisheries' EFH conservation recommendations (50 CFR 600.920).

Table 3. Species with designated EFH in the estuarine EFH composite in the State of Oregon.

Groundfish Species	
Leopard Shark (southern OR only)	*Triakis semifasciata*
Soupfin Shark	*Galeorhinus zyopterus*
Spiny Dogfish	*Squalus acanthias*
California Skate	*Raja inornata*
Spotted Ratfish	*Hydrolagus colliei*
Lingcod	*Ophiodon elongatus*
Cabezon	*Scorpaenichthys marmoratus*
Kelp Greenling	*Hexagrammos decagrammus*
Pacific Cod	*Gadus macrocephalus*
Pacific Whiting (Hake)	*Merluccius productus*
Black Rockfish	*Sebastes maliger*
Bocaccio	*Sebastes paucispinis*
Brown Rockfish	*Sebastes auriculatus*
Copper Rockfish	*Sebastes caurinus*
Quillback Rockfish	*Sebastes maliger*
English Sole	*Pleuronectes vetulus*
Pacific Sanddab	*Citharichthys sordidus*
Rex Sole	*Glyptocephalus zachirus*
Rock Sole	*Lepidopsetta bilineata*
Starry Flounder	*Platichthys stellatus*
Coastal Pelagic Species	
Pacific Sardine	*Sardinops sagax*
Pacific (Chub) Mackerel	*Scomber japonicus*
Northern Anchovy	*Engraulis mordax*
Jack Mackerel	*Trachurus symmetricus*
California Market Squid	*Loligo opalescens*
Pacific Salmon Species	
Chinook Salmon	*Oncorhyncus tshawytcha*
Coho Salmon	*Oncorhyncus kisutch*

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